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# ADVANCED ON-THE-JOB TRAINING SYSTEM: OPERATIONAL CONCEPT DOCUMENT

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May 1990

Interim Technical Paper for Period August 1985 - December 1989

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This paper has been reviewed and is approved for publication.

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The Operational Concept Document describes the mission of the Advanced On-the-job Training System (AOTS) and its operational and support environments. It also describes the functions and characteristics of the AOTS computer system with respect to the overall Air Force training system.

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Reviewed and submitted for publication by

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Chief, Advanced On-the-Job Training System Program

This publication is primarily a working paper. It is published solely to document work performed.

## SUMMARY

The Advanced On-the-job Training System (AOTS) was an Air Staff directed, AFHRL developed, prototype system which designed, developed, and tested a proof-of-concept prototype AOTS within the operational environment of selected work centers at Bergstrom AFB, Texas, and Ellington ANGB, Texas, from August 1985 through 31 July 1989. The Operational Concept Document describes the mission of AOTS and its operational and support environments. It also describes the functions and characteristics of the AOTS computer system with respect to the overall Air Force training system.



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## PREFACE

This paper was developed by Ball Systems Engineering Division, the AOTS on-site integration and management contractor, under Government Contract Number F33615-C-84-0070. The AFHRL Work Unit Number for the project is 2557-00-03. The primary office of responsibility for management of the work unit is the Air Force Human Resources Laboratory, Training Systems Division, and the Air Force AOTS manager is Major Jack Blackhurst.

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# ADVANCED ON-THE-JOB TRAINING SYSTEM OPERATIONAL CONCEPT DOCUMENT

## 1. SCOPE

### 1.1 IDENTIFICATION

This Operational Concept Document (OCD) describes the mission of the Advanced On-The-Job Training System (AOTS) and its operational and support environments. It also describes the functions and characteristics of the AOTS computer system with respect to the overall Air Force training system.

### 1.2 PURPOSE

The purpose of AOTS is to provide trainees, trainers and evaluators, supervisors, training managers, commanders, and Air Force Specialty (AFS) Functional Area (FA) managers an integrated, computer-based training management, development and delivery, and evaluation system. The system provides a systematic and flexible method to control the overall management, development and delivery and evaluation of Air Force On-The-Job (OJT) training. AOTS is a modular software package designed for standard AF computer systems that can be varied to meet user defined requirements.

### 1.3 INTRODUCTION

This document identifies the operational concept for employment and maintenance of AOTS in the Air Force. It briefly describes the system as it will exist at maturity and defines how it will be used to control training at the first line supervisor level and manage the force structure through all echelons. Section 3 of this document describes the AOTS mission and the environment in which it will function. Section 4 describes the functional requirements of the system and discusses how they are implemented through all levels. Section 5 identifies the various agencies involved with this system.

## 2. REFERENCED DOCUMENTS

a. AOTS System Specification (70S647400)

b. Air Force Inspector General Functional Management Inspection Report (PN 76-269, April 1977) on Air Force On-the-Job Training

c. Program Management Directive No. PMD2029(21)/63751F, October 9, 1986, Training Systems Technology

# 3. MISSION

## 3.1 MISSION NEED REQUIREMENTS

3.1.1 General: Technical skills of Air Force enlisted personnel are acquired, maintained, and upgraded through formal training (FT), Career Development Courseware (CDC), and On-the-Job (OJT) training. In addition to these technical job skills there are other training requirements to qualify people in the skills they need as Air Force members or to hold specific primary or additional positions. Increasing weapons system complexity, the shortage of qualified trainers, and increasing mission demands have made the overall training program progressively more difficult to manage and conduct. The OJT portion with its dependence on paper records has become increasingly expensive to operate, difficult to manage, and ineffective in terms of determining the qualifications of personnel in both job AFS and position qualification (eg; mobility) skills.

3.1.2 IG FMI: To formally address training efficiency and effectiveness problems, the Air Staff requested the AF Inspector General perform a Functional Management Inspection (FMI) of On-the-Job Training. The April 1977 inspection report identified the need for a number of specific improvements in the OJT system. These included:

a. Reduction of training administration costs.
b. Increased quality of training.
c. Increased relevance of training to mission requirements.
d. Better methods for identifying and updating specific performance and training requirements.
e. Better and more frequent, valid and reliable evaluations of job task proficiency.
f. Better determination of OJT costs and unit training capacity.
g. Reducing the administrative paperwork burden on training personnel and allow them to concentrate on developing and delivering training.
h. Automated collection and reporting of data to track and evaluate training progress and system effectiveness.

## 3.2 PRIMARY MISSION

The mission of AOTS is to improve the efficiency and effectiveness of the Air Force training system. It will accomplish this by automating the management, development and delivery, and evaluation of training.

3.2.1 Training Management: AOTS will support supervisory level management and Air Force -wide training and force management by:

a. Providing a comprehensive, computer-based Master Task List (MTL) of requirements for job proficiency in an AFS.
b. Providing a computer-based method of refining MTLs to include the training required for specific duty positions within an organization.
c. Using the MTL to define training requirements to become fully qualified in specific operational positions.
d. Reducing the paperwork burden of scheduling, tracking progress, evaluating task/test performance and managing the flow of training data at all echelons.
e. Facilitating AF personnel force management of the performance and training requirements for entire AFSs, groups of members within AFSs, groups of members across AFSs, and individual trainees.
f. Accumulating the status of training by AFSs across the Air Force, Air National Guard and Air Force Reserve.
g. Collecting the data to monitor and evaluate total Air Force training costs.

3.2.2 Training Development and Delivery: AOTS will support the development and delivery of training by:

a. Making computer-based or aided instructions and activities available that will reduce the requirement for technically trained people to act as trainers and standardize the training delivered.
b. Using computers to adapt modern training development and delivery procedures to work center environments.
c. Allowing work center delivery of both job task and ancillary training.

3.2.3 Training Evaluation: AOTS will support training evaluation by:
a. Making computer-based or supported evaluation tools or methods available in the work center.
b. Automating the supervisor level documentation and tracking process.
c. Providing an automated, comprehensive method of tracking training data for force management, reporting and/or cost analysis.

## 3.3 SECONDARY MISSION

AOTS has the secondary missions of providing feedback to Air Training Command and Functional Area managers on the effectiveness of training and providing USAF DP with overall AF training status.

It will also provide feedback to OMC and Functional Area managers on MTL validity.

## 3.4 OPERATIONAL ENVIRONMENT

3.4.1 General: The AOTS operationaltional environment will include all Air Force work centers. It will involve computer hardware and software used at the work center level to manage or deliver the individual training, up through the host base to the MAJCOM/Functional Area levels. See Figure 1 - AOTS System Architecture. The computer hardware will primarily be that which already exists and is used to perform the necessary functions at that level. The AOTS software will be able to be installed on any existing or projected new computer equipment at any of these levels. When used in the AOTS mode at the work center level, the AOTS software programs may require the equipment to become dedicated until the completion of the training. At other levels, the software should run in parallel with and be compatible with required programs. The software configuration should be adjustable to the existing equipment and be common between all levels except where machine dependencies cause differences (the virtual machine interface). The software will be user friendly and allow trainers and/or trainees to learn how to use the programs quickly.

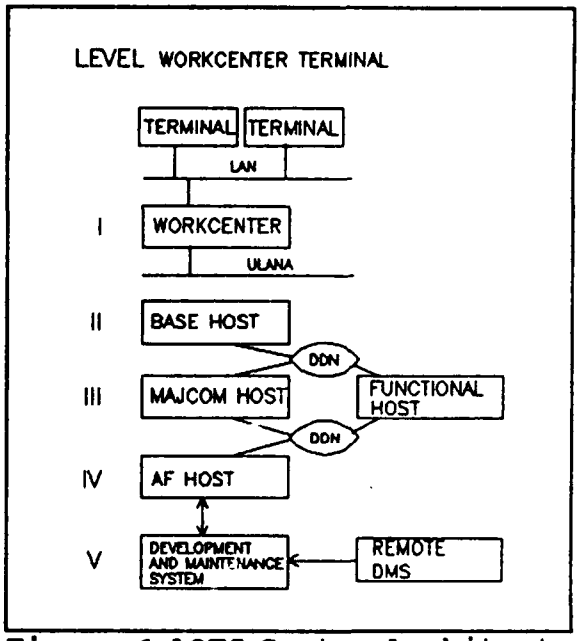


**Figure 1** AOTS System Architecture

3.4.2 Functional: AOTS will function within the existing Air Force training system depicted in Figure 2 - AF Training System. AOTS will only affect the areas represented by the dotted lines. The existing Occupational Measurement Center (OMC), Career Functional Area Managers and MAJCOM's will define and develop the Specialty Training Standard (STS) Job Training Requirements. These standards will be the primary source to develop the Master Task List for an AFS. Formal Training (FT) and Career Development Course (CDC) requirements will continue to be the responsibility of other organizations. Task proficiency training requirements not addressed by FT or CDC's will become the Master Task List for that AFS. They will be entered into the AOTS data base as a Generic

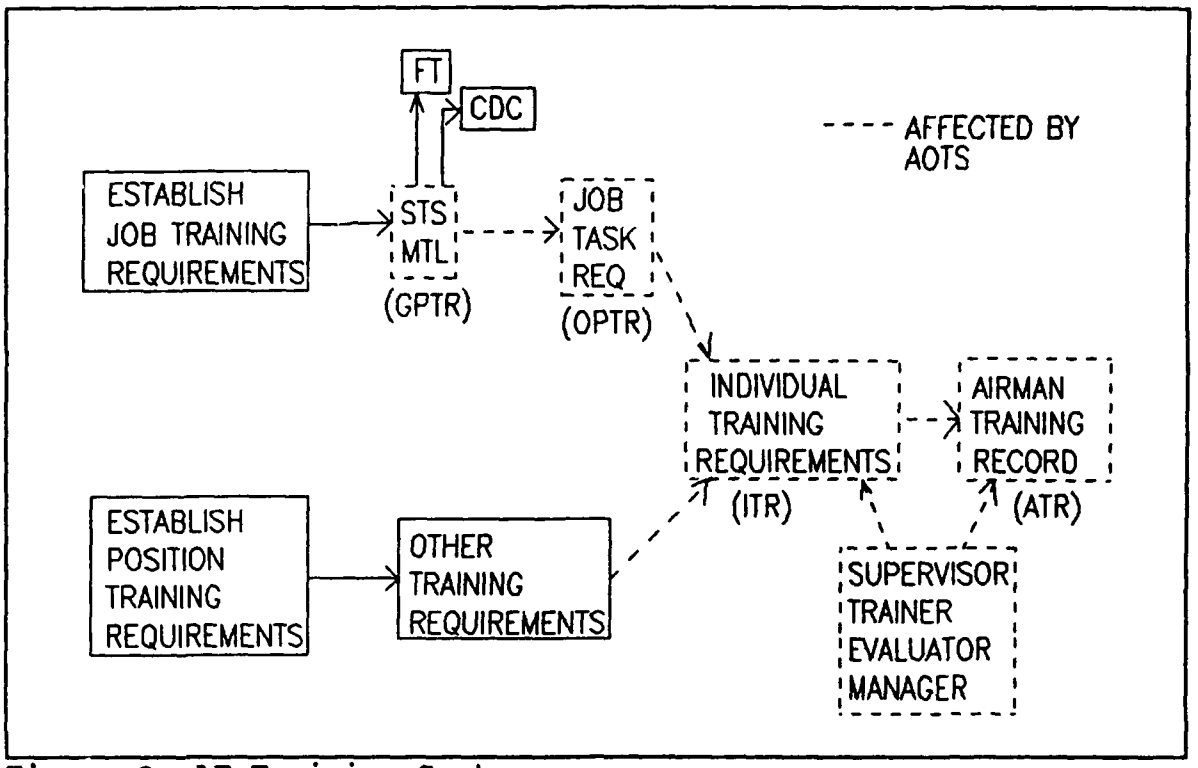


**Figure 2** AF Training System

Position Task Requirements (GPTR) list. At the specific base the GPTR will be filtered against mission taskings and the Operational Position Task Requirements (OPTR) list derived. In the same manner, existing functional managers and supervisors will determine the other training requirements associated with specific positions. This will include ancillary training, (i.e. mobility), additional duty training (i.e. Regulations monitor) and position qualification training (Assistant Crew Chief). A master list of these other training requirements (OTR) will also be entered into the AOTS data base. This master OTR will be used to define the other individual training requirements for a position and be combined with the OPTR to develop the Individual Training Requirements (ITR) for the position. Supervisors will then assign personnel to the position. Previous training will automatically be subtracted from the ITR and the individuals training requirements determined. This refined ITR will then become the Airman's Training Record (ATR). As training events are accomplished per the ITR, AOTS will be used to record the results in the ATR. Trainees, trainers and evaluators, supervisors, training managers and commanders will then be able to access the AOTS data base to manage the training status of the trainee. Additional capabilities will include the ability to develop computer based instruction and deliver it in the work

center, standardize training and evaluation, and provide automated tools for managing, delivering and evaluating training.

## 3.5 SUPPORT ENVIRONMENT

3.5.1 Hardware: Upgrades such as memory expansions, additional communications ports, printers or optical character readers may be required. However, no specific, dedicated new hardware will be required to operate the AOTS system. The Development and Maintenance system (DMS) will be dedicated for development and require at least one of each type system used in the operational system. Since equipment will not normally be acquired as part of this system, maintenance contracts already being used for the existing computer systems will not require modification for AOTS. When hardware upgrades are necessary, the possessing unit will be responsible for obtaining necessary maintenance. The DMS computers will be procured/leased through normal channels with appropriately contracted maintenance.

3.5.2 Software: Three elements of the software will require support.

a. The AOTS operating system and applications software including documentation will be maintained by a system support agency as determined by the using command(s). This agency will be responsible for system configuration management to include all upgrades to the software as well as the distribution and dissemination of upgrades and documentation.

b. AOTS data bases can be divided into two types. The AFS specific data bases, and the operating location data bases. The AFS specific data bases include the MTL, other training requirements list and associated cross references to training material and evaluation instruments. This information will continue to be developed, maintained and upgraded by AFS Functional Area Managers at the MAJCOM or AF level. Host base training managers will be responsible for coordinating the maintenance and upgrade of operating location data bases.

c. Training material will be developed and maintained by Functional Area managers at all levels. The organization developing the computer based or supported training material delivered through AOTS will be responsible for maintaining and upgrading that material.

3.5.3 Personnel: Operation and use of AOTS at all levels except DMS will be the responsibility of using organizations. Training managers at the organizational unit level will be trained in the operation and use and be responsible for training end users. Using MAJCOM training managers will be responsible for training organizational training managers.

3.5.4 Host Organizations: Using MAJCOMs will coordinate with host base data processing managers to provide required support.

## 4. SYSTEM FUNCTIONS AND CHARACTERISTICS

### 4.1 SYSTEM FUNCTIONS

The three major segments of AOTS are shown in Figure 3 - AOTS System Components and described in the following paragraphs.

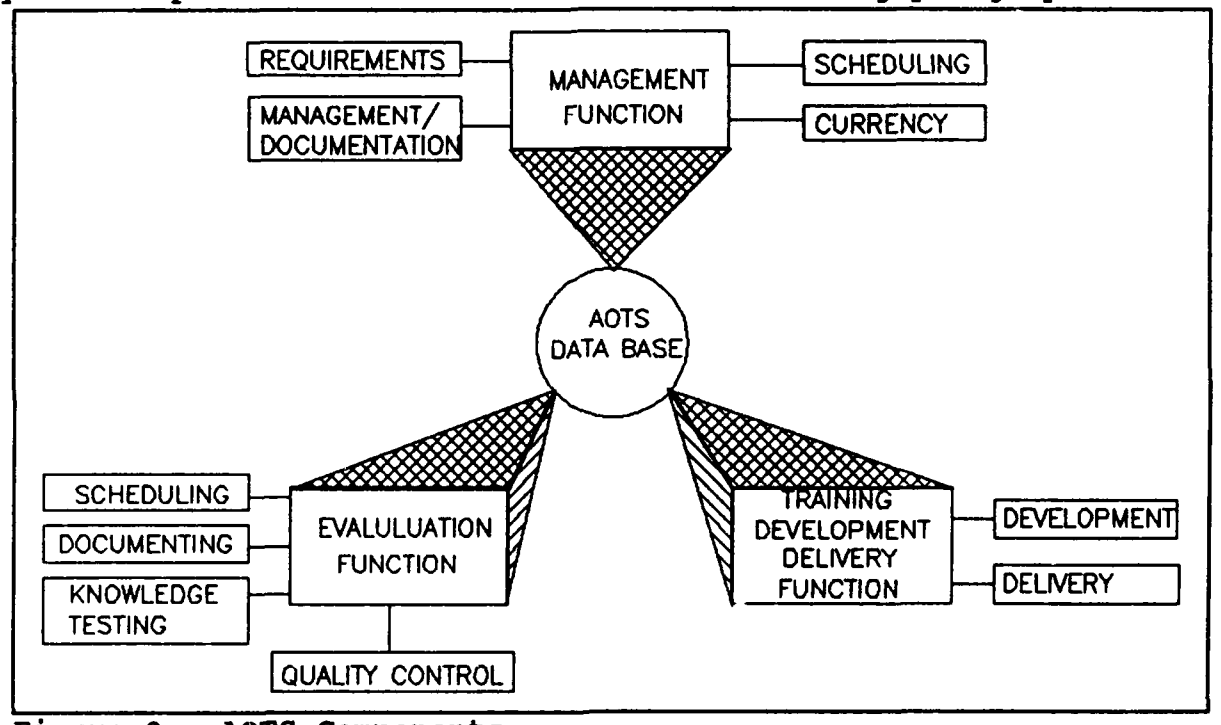


Figure 3 AOTS Components

4.1.1 Management Function: This portion of AOTS allows the entry of the AFS MTL (GPTR and OPTR) and other training requirements list (OTR), the tailoring of these lists to derive the individuals training requirements, as well as the individual trainee's personal information. The trainee's personal information will be automatically extracted from the Personnel Data System (PCIII). With this information the supervisor would develop the task training requirements for the trainee. The supervisor or trainer will then use this list of training requirement to assign, schedule, manage and document the training. The segment can then be used to monitor the progress and/or currency of the trainee. The trainee can use the segment to monitor his/her progress and the

training managers, commanders and functional area managers has the capability of coordinating and accessing the overall training status of entire units, AFS's or other groups.

4.1.2 Evaluation Function: This portion of AOTS allows the supervisor or trainer to schedule and document skill proficiency evaluations. It also allows the scheduling and evaluation of skill knowledge tests. The trainee can use it to monitor status and take knowledge tests. With automated tracking capabilities it also provides standardization and quality control of training and evaluations.

4.1.3 Training Development and Delivery Function: This portions provides a computer-based, interactive, instructional and evaluation materials development process in which training materials can be written, evaluated, and revised. It also provides for computer presentation, storage, distribution, and control of training and evaluation materials.

## 4.2 COMPUTER SYSTEM FUNCTIONS

AOTS consists of a software package which will run on available computer systems. All the functions described in paragraph 4.1 above are accomplished by user interaction with the computer running AOTS. No specific computer hardware or peripheral components are required to run the system. Rather, AOTS is designed to follow Air Force standards and adapt to existing equipment and operate within available minimum configurations.

## 4.3 OPERATOR AND USER INTERACTION

There are five categories of users of the AOTS. They are trainees, trainers/evaluators, supervisors, training managers and commanders.

4.3.1 Trainees: At the lowest level, the trainee will interact with AOTS to accomplish on or off-line training and/or evaluations. They will also be able to access their personal training records and monitor their progress. Access to required information will be allowed without the ability to change or modify unauthorized portions.

4.3.2 Trainers/Evaluators: Trainers and/or evaluators will be allowed interactive access to schedule or deliver instructions and evaluate trainee progress. They will also be able to certify task knowledge and proficiency training completion.

4.3.3 Supervisors: Supervisors will have the ability to interactively modify generic position task requirement lists to

build specific training packages for individual trainees. They will also be able to access multiple trainee and/or trainer records to more effectively manage the training requirements of their units. They will be able to monitor progress, create/modify operational position task requirements, perform qualification assessments and certify task knowledge and proficiency training completions.

4.3.4 Training Managers: Managers of the Training system will have access to overall system reports to monitor the status of groups of trainees, organizations, or Air Force Specialties. They will have the history of individual training and can perform training and evaluation quality control from the individual to the unit level.

4.3.5 Commanders: Section chiefs, commanders, and other managers will have access to the training status of the entire unit in a form that will allow them to effectively monitor overall training status and mission preparedness.

## 4.4 COMPUTER SYSTEM CHARACTERISTICS

### 4.4.1 Hardware:

4.4.1.1 Current AF environment. At each level AOTS will use computers and peripheral devices that are standard AF equipment or Commercial Off-The-Shelf (COTS). AOTS is designed to function primarily with what is available at the appropriate level. At the lowest work center level, it will function on the personal computers such as the Z-248 while at the base level it should function on UNISYS 1100/60 base computer terminals and other standard work center computers. Peripheral equipment will, in most cases, be whatever is available at that level to support the host computer. In some cases, additional equipment such as expansion memory, disk drives (including floppy), optical character readers, modems, and network interface units will be required to meet minimum configuration requirements for the specific computer and level. In all cases, this additional equipment will be COTS.

4.4.1.2 Standard Systems environment. AOTS is designed to take advantage of advancing technology as the AF standard systems environment evolves. AOTS will be designed and developed using established or emerging Air Force or Department of Defense standards to the maximum extent possible. This adherence to standard systems will allow the upgrading of systems to take advantage of new technology without becoming tied to specific systems. This same adherence to standards will be used to allow AOTS to take advantage of distributed system architectures as well as stand alone systems. Communications will use the Defense Data

Network (DDN) for long haul and AF standards such as ULANA for local area networks.

4.4.2 Software: The software for AOTS will be stand alone programs that can be loaded onto the applicable computer and function as an independent program. They will require standard compilers and operating systems appropriate for the level of the computer. At the lowest level, floppy disks may be used to load the program and accomplish the training. Use of existing modem or local area networks will allow AOTS to function interactively at all levels. In the same manner as hardware, Air Force computer software standards will be incorporated into AOTS and allow the software to function as stand alone programs or as a networked system within the base or MAJCOM.

## 5. GOVERNMENT AGENCIES

| | | |
|---|---|---|
| a. | Implementing Agency | AF Human Systems Division/YAT |
| b. | Developing Agency | AF Human Resources Laboratory/ID |
| c. | Supporting Agency | AF Communications Command |
| d. | Using agencies | MAJCOMs |
| e. | Participating Agency | Air Training Command |
| f. | IV&V agency | AF Communications Command |

g. For the system to function effectively it must interface with other AF systems that depend on data from or provided to AOTS. The same is true for the interfaces between segments with the AOTS. A fully operational AOTS being used Air Force -wide would interface electronically with other Air Force systems. An example of this type interconnections is shown in Figure 4 - AOTS External and Internal Interfaces.

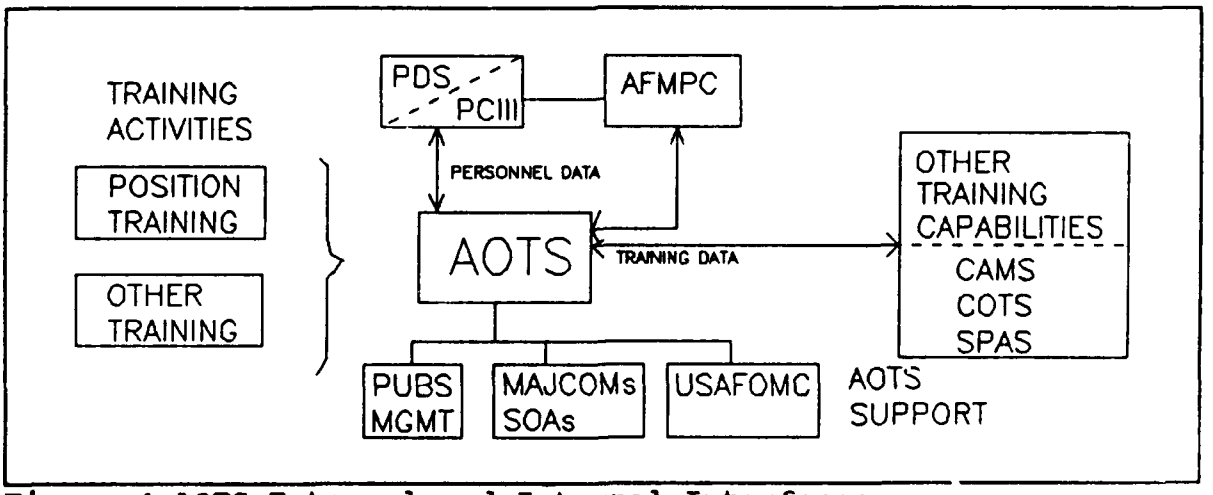


**Figure 4** AOTS External and Internal Interfaces

6. NOTES

Not applicable

7. APPENDICES

Appendix A - ACRONYMs

## Appendix A - ACRONYMs

| | |
|---|---|
| AF | Air Force |
| AFMPC | Air Force Military Personnel Center |
| AFS | Air Force Specialty |
| ANG | Air National Guard |
| AOTS | Advanced On-the-Job Training System |
| ATR | Airman's Training Record |
| CAMS | CORE Automated Maintenance System |
| CDC | Career Development Course |
| COTS | Commercial Off-The-Shelf |
| DDN | Defense Data Network |
| DMS | Development and Maintenance System |
| DP | Deputy Chief of Staff for Personnel |
| FA | Functional Area managers |
| FMI | Functional Management Inspection |
| GPTR | Generic Position Task Requirements |
| IG | Inspector General |
| ITR | Individual Training Requirements |
| MAJCOM | Major Command |
| MTL | Master Task List |
| OCD | Operational Concept Document |
| OJT | On-the-Job Training |
| OMC | Occupational Measurement Center |
| OPTR | Operational Position Task Requirements |
| OTR | Other Training Requirements |
| PCIII | Personnel Concepts III (Personnel Data Systems) |
| PDS | Personnel Data System |
| SOA | Special Operating Agency |
| SPAS | Security Police Automated System |
| STS | Specialty Training Standard |
| ULANA | Uniform Local Area Network Architecture |
| UNISYS | United Systems, Inc. (formerly Sperry Corp.) |
| USAF | United States Air Force |
| USAFR | US Air Force Reserve |